GARDEN AND FOREST.

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The Yellowstone Park.

THE men and women who take an intelligent and active interest in Yellowstone Park are comparatively few, widely scattered throughout the country and not organized for any united aggressive or defensive policy. Here and there a far-sighted man appreciates the immense value which such a reservation will be to the country in the future, and there are a few enthusiastic tourists who have camped in and around it and have acquired a genuine affection for the place, but the great body of our citizens very naturally are absorbed in interests which are nearer home, and they have little time or energy or thought left after their daily labors for anything so remote from their present and personal interests. One would think the Congressmen of the country, whose duty it is to look after the affairs of the nation, would give studious attention to the great reservations of public land which belong to the people which they represent. But they, too, are engrossed with other matters which are of immediate importance to themselves or to their constituents, so that the parks and public forests receive a small fraction of their attention.

There is a small group of men, however, whose interest in the Yellowstone Park never sleeps, for it is an interest born not of public spirit, but of selfishness. This is the partnership whose lobby is working now, as it has done in the last Congress and the one before, to confiscate a portion of the park for private use. It is not a scheme to provide railway facilities for any particular section; it is a scheme to allow no railroad but one through the park, and then to control the franchise. Of course, this project is utterly bad, against public policy generally and against the interests of the park particularly. It has been opposed by every Secretary of the Interior for eight years past, and by every one else who has any genuine interest in the park. The best-informed observers believe that it is primarily a job to get from Congress something which can be sold for cash. This year, instead of loading the bill to establish the boundaries of the park with a rider, the lobby has introduced a separate bill asking for a right of way through it. A majority of the Committee on Public Lands in the House has been secured, and the bill has been reported favorably. And yet this park belongs to the nation, and not to this set of railroad speculators. Every man in the country is part-owner of it; every man has a right to the protection of his own property, and every man should in some way make a vigorous protest against this condemnation of public property to private use. It is, therefore, the duty of every one who reads this article to write at once to his representative and request him to see that this measure is stopped where it is.

Besides this Montana Mineral Railway job, there has been reported in the Senate a bill which cuts off about one-half of the forest-reservation which adjoins the park on the east, and also cuts off the south-west corner of the reservation on the south. It will be remembered that this reservation was set apart by a proclamation of the President under the power granted to him a year ago, and Congress is now considering a measure to enlarge the park so as to include this reservation. This bill is nominally in the interest of the people of Wyoming, who wish to retain control of this forest, but really the people of Wyoming have greater interest in preserving this forest than any other people of the United States, for it will insure the preservation of a forest which will almost certainly be destroyed if the national protection is removed from it. A most serious mistake is that of cutting off the south-west corner of the forest, which is done, as it appears, in the interest of railway corporations, simply because they think they may some day want to pass that way. No survey has been made, and probably there will never be any occasion for going through this region. If any such railway line were needed it would be much easier and better to pass on the south side of the Tetons than to go around on the north side. Of course, the mining-prospectors and timber-gatherers have an interest in reducing the reservation, but experts declare that there are no mining properties of any serious value in this portion of the reservation which it is desired to hand over to destruction.

It is high time that the whole country should be aroused to face this matter as it stands. Here are two bills favorably reported, both of which are inexcusably bad. No railway franchise should be allowed within the park under any condition, and this particular one is essentially vicious all the way through. The whittling down of the forest-reservation is another serious attack on public rights which should be strenuously opposed. Instead of diminishing this area, other reservations should be established as rapidly as they can be intelligently located and their boundaries judiciously determined. The time will come when a broad and strong current of public opinion will hold Congress to its duties in this direction, but until then it is the duty of every one to appeal to his representative and to any other member of Congress with whom he may have influence to protect from spoliation these few isolated remnants of our great forest-domain which by a fortunate chance have been set apart to be held forever as public property. In this way alone can their permanent safety be assured.

For nearly a month the proposed speedway in Central Park has been a topic for animated discussion in the newspapers of this city, and the writers for the press, called upon to give a reason for the faith that was in them, have found it necessary to pay studious attention to many of the problems in the design, construction, maintenance and management of public parks. We have often called attention to the vague and inconsistent views as to the true functions of city parks which are held even by intelligent persons, and therefore this discussion of first principles has had a genuine educational value in the clearing away of misconceptions. Only a few years ago the President of

the Park Board in this city attempted to justify a project of his to fill up with carpenter-work one of the fairest dells of the park by calling the spot "a piece of unimproved ground," and it seems to be a prevalent opinion that land which cannot be driven over or trampled on or covered with structures of some kind can serve no useful purpose.

Of course, this argument was used by the advocates of the new road, who stated that it would be laid out in an "unused" portion of the park. One of the Park Commissioners happily exposed this fallacy in a letter addressed to the Legislature to urge the repeal of the act authorizing the speedway. He stated that there can be no "unused" portion of the park; that its green fields are fulfilling their highest use when no foot treads upon them; that the park really exists for its landscapes, and that its elements have their highest value as they combine to give it the charm of a rural scene. It is a place to look at primarily, and its untrodden greens and unentered groves are the very foundations of its beauty. This is a lesson which cannot be too often or too strongly insisted upon. All classes and every interest which have ever clamored to get possession of some portion of the park have urged in favor of their encroachment that "the park was made to use, and not to look at," when the fact is that its primary use is to be looked at; that it is beauty which gives it value, and a value which is not sentimental, but real, fundamental and practical.

Notes of a Summer Journey in Europe.—XII.

SELDOM have I spent time so pleasantly and profitably as I did two or three days at the Botanic Garden, or little arboretum, of the Government Forest Academy at Münden. Both the pleasure and profit which I derived were largely due to the fact that I was under the guidance of Dr. H. Zabel, whose modesty does not allow him to take any more pretentious title than "Königlicher Gartemeister," but whose acuteness and carefulness as a botanist and skill and knowledge in cultural details give him a well-deserved reputation, worth much more than any formal title.

The Forest Academy at Münden was established about twenty-two years ago. It is situated almost in the heart of the little town, which, by the railway, is about half an hour's ride from Cassel, and is in the midst of a region of large areas of forests. Three or four degrees below zero of Fahrenheit is considered very cold here and especially disastrous to vegetation when there is little or no snow on the ground, as occasionally happens, while eighty-five degrees in summer is considered very hot, and is rare. The temperature is greatly modified by the surrounding forests, but early frosts in September and late frosts in May are liable to occur. The grounds of the academy and its connected Botanic Garden only comprise about eighteen acres, which are almost entirely given up to classified collections of hardy plants. The academy buildings are well fitted to answer their purposes, and comprise library, laboratories, lecture-rooms and rooms devoted to specimens, and a collection of tools and appliances relating to arboriculture, forestry and dendrology. The students have the extensive surrounding woods in which to prosecute study and work in practical forestry. It is an excellent station for a school of this kind, because within easy access woods are to be found growing under different conditions of soil and exposure.

It is not my purpose, however, to notice this establishment as a forest-school, but rather to mention a few individuals in the remarkable collection of shrubs which exists here. The limited area of the grounds immediately about the academy does not permit of a great growth of trees nor of the introduction of all the numerous garden forms, but the collection contains typical examples of the various species which have attained a fair size considering the short time since the institution was established. But the same number of years have sufficed for a mature growth of most shrubs, which are largely arranged in botanical order and sequence and afford opportunities for some most interesting studies.

I was much surprised to find here some specimens of rare plants which are not to be seen in collections of much greater fame and endowment, for the whole annual cash appropriation for the maintenance of the Münden garden would hardly pay the salary of one good gardener in America.

Considering the winter temperature it was interesting to note unexpected indications of hardiness in certain plants, while others, which are considered perfectly hardy in the somewhat colder climate of Boston, are said to be tender here. Undoubtedly, the discrepancies in records of hardiness are largely due to the difference in the heat of the summers and also to the degree of humidity.

The Japanese Ampelopsis (A. tricuspidata, or A. Veitchii, as it is commonly known in nurseries), for instance, is not considered hardy at Münden, while it is now one of the most common and best-known wall-climbers in Boston. It is a fact that seedlings or young plants are liable to have a part of their stems destroyed in winter, but when the plants become well established in well-drained soil there is no further trouble.

Mere hardiness, however, is not the only consideration necessary to the successful growth and naturalization of plants, and this is illustrated by the fact that the Douglas Spruce does not seem to thrive at Münden, although it grows so finely at Berlin and most other places where it has been introduced. Plants twenty years old are still shabby little things a few feet high. Whether this is owing to peculiar conditions of the soil or some such cause is a matter for investigation. But some other Pacific coast or Rocky Mountain conifers do well, for we find here the much more tender Sequoia gigantea with a stem over a foot in diameter, Lawson's Cypress twenty-five feet high, and even Pinus contorta quite healthy and fifteen feet in height. The Western Hemlock (Tsuga Mertensiana) has grown over twenty-five feet, while two Japanese conifers, Picea Alcoquiana and Larix leptolepis, have made the exceptional growths of over thirty and of forty-five feet respectively. Although the latter bears an abundant crop of cones, it produces no good seed.

Perhaps the very rarest plants in the collection are our Cercocarpus, the so-called Mahogany-trees of the western states, both of the United States species being represented. Probably these plants cannot be counted of much ornamental or horticultural value, and perhaps it is for this reason that greater efforts for their successful cultivation have not been made. Nevertheless, they represent a curious and interesting genus in the Rose-family, and on this account one would expect to find them in cultivation in botanic gardens or arboretums. They are, however, generally considered difficult to cultivate. The plants at Münden are the only specimens I ever saw, and it is doubtful if examples exist even in such great collections as there are at Kew. Cercocarpus ledifolius has attained a height of eight feet and has flowered, while C. parvifolius (C. betulifolius, Nuttall) is about seven feet high, and has flowered and fruited, and is considered quite hardy here. On the other hand, Stuartia Virginica is not thought hardy, although it lives. Some other American shrubs seem quite at home, and grow with a vigor rarely seen in such species in cultivation. Our little White Mountain Cutler's Willow (Salix Cutleri) is thriving well, the extremely rare Neviusia Alabamensis is represented by a very good vigorous plant, and the uncommon Colt's-foot (Galax aphylla) is better than is usually seen in gardens. The rare Fendlera rupicola is here bearing fruit, and a fine large clump of Itea Virginica was just (August 18th) going out of bloom.

All accounts describe the little Pale Laurel (Kalmia glauca) as being a slender and very straggling shrub. It certainly usually is so in its native swamps, and in cultivation it rarely assumes a very bushy character. That it may be grown in much better form is shown in this garden, where may be seen a splendid compact specimen three feet high and five feet across. This species is so different from the other two (K. latifolia and K. angustifolia), and it blossoms so much earlier, that it should be better known in all gardens where Heath-plants will grow. The tomentose-leaved Clethra, which has often been classed by botanists as merely a southern form of our C. alnifolia, was already in bloom. This specimen is ten feet high, and bears the very appropriate name of C. tomentosa, by which cultivators distinguish it from the northern smooth-leaved species. It has a peculiar value in its habit of blooming much later than the typical C. alnifolia. Pyrus rivularis, the Wild Crab of Oregon and that region of our continent, is here about twelve feet in height, and fruiting, while the Pawpaw (Asimina triloba) is a bush seven or eight feet in height.

The garden contains a considerable number of interesting Japanese species of woody plants. I was surprised to find Abelia serrata counted among the hardy shrubs. Wherever it can be found to endure the winters this should be a desirable plant, on account of its pretty light reddish, sweet-scented flowers and deep green foliage. Helwingia rusciflora, also commonly known as H. Japonica, is a native of Japan and China rarely seen in cultivation, probably because it has no

known ornamental qualities. But it is interesting as a curiosity, because the very small and inconspicuous flowers are produced on the midribs of the leaves about in the centre of the upper surfaces. The species is dicœcious, the staminate and pistillate blossoms being produced on separate plants. The specimen at Münden is three or four feet high and is staminate, and has therefore produced no fruit. This curious shrub has not yet proved hardy at the Arnold Arboretum, but it has flowered, producing staminate blossoms. As there appear to be no records to the contrary, it would seem that the plant has not yet fruited in Europe or America. The fruit is a rather dry little drupe, but it is said that the natives of the mountains of Japan use the young leaves as a vegetable. Hydrangea scandens and Schizophragma hydrangeoides are two Asiatic plants about which there is often much confusion. The Schizophragma has not yet been found very hardy at Münden. In ordering either of these species from nurseries one is liable to get the other. But the Hydrangea may always be known by its very few sterile or ray flowers having four large rounded or retuse bracts together and in opposite pairs, while in the Schizophragma the leafy bracts are solitary, oval, narrow and somewhat pointed.

Another plant which may be mentioned, because extremely rare in cultivation, is Eleutherococcus senticosus, a hardy Araliaceous plant from northern Japan and China, which I found here seven feet high and in fruit; while Acanthopanax ricinifolia, a member of the same family, is fifteen feet in height and gives every promise of becoming the large tree with a tropical aspect, which it is said to be in Japan. This species has proved quite hardy at Boston, and it is probably capable of withstanding quite a number of degrees below zero of Fahrenheit.

The species mentioned give but a slight idea of the character of the collection of shrubs and trees under Dr. Zabel's care, and yet the rare herbaceous perennials have not been referred to. The collection contains a very interesting and complete series of species and varieties of Spiræas, one of the most distinct of the least known being S. longigemmis of Maximowicz. Numerous hybrids of these, and also of Bush Honeysuckles, have been procured and propagated, and from these some improved forms possibly may be introduced to add beauty to our gardens.

Arnold Arboretum. *J. G. Jack.*

Plantains.

THE following extract is taken from the last report of the Botanical Garden at Demerara:

The generally accepted opinion of botanists is that the Banana and Plantain are but forms of one species. Yet, from an economic point of view, the two are widely separated, for, in regard to utility as a food-product, the banana cannot be compared with the plantain. Without explaining all the differences, it may be briefly stated that while the banana is a pleasant, agreeable and much-appreciated fruit, it has, judging by the preference of the people of torrid lands, little economic value as a food-product; the plantain, on the other hand, is regarded as intrinsically one of the best natural food-products in the world. Yet the opinion of the botanists is in a way supported by the non-scientific observer, for, except in rare instances, only after long and well-trained field experience can one plant be distinguished from the other when not in flower or fruit. When in fruit, however, the case is different. There is then a character, observable at sight, which only requires to be pointed out for the veriest novice in the subject to be able to tell which is which. In the Banana, after the fruit has set, the succeeding clusters of flowers, often a hundred or more in number, and their large embracing bracts, drop away, leaving a clear, absolutely naked, long extended and still elongating stem or axis, hanging tail-like two to three feet beyond the fruit, with the firmly compacted mass of unopened bracts and flowers, bud-like, at the end; while in the Plantain the stem ceases to extend more than twelve or eighteen inches beyond the fruit, the succeeding clusters of flowers and bracts all opening to the very end, and remaining persistent, withered and dry—the trash as it is called in colonial phraseology—permanently attached to the stem. In the Banana the axis continues to grow as long as the fruit hangs, cluster after cluster of flowers, with their bracts, opening and dropping away, a mass, like an enlarged Nelumbium-bud, still unopened, remaining at the far extended end when the bunch is cut; while in the Plaintain the growth of the axis is arrested soon after the fruit sets, the abortive flowers opening, and remaining attached, from end to end of the stem. A single exception to the rule obtains in the case of the Dwarf or Chinese Banana (Musa Cavendishii), in which, as in Plantains, the abortive flowers and their bracts are constantly persistent. The texture of the plantain is such that at whatever stage it is used, whether green or ripe, it must be cooked to make it palatable. It is this quality in the plantain which makes the great economic difference between the two fruits. Plantains are chiefly used by the populace while still green—i. e., cut at some period before they are full grown. They are cooked either by boiling or roasting, chiefly the former. To successfully peel a green plantain without soiling it, the operation must be performed with wet hands or with the fruit immersed in water. The plantain contains a measure of tannic acid, and consequently in boiling in a metal pot has a tendency to turn very dark. This may, however, be prevented by boiling a little fat with the fruit—say a bit of fat pork. Green plantains are also used for making soup. For this purpose they are boiled and then pounded in a mortar, when they form a homogeneous mass, like dough, which is put into soup and eaten with it. In the mature, but still green stage, plantains are roasted and eaten with butter, pepper and salt, and in some cases cheese. In this state they are delicious. The plantain parts with its heat very rapidly, and in cooling it loses, to the palate, much of its best taste. It is spoiled by rewarming. For this reason roast plantains are usually served wrapped in a table-napkin, for, to be enjoyed at all, they must be eaten before they cool. When ripe—that is, when the skin has turned yellow—a fruity character is assumed, and then they are used either baked whole in an oven, or cut in slices and fried. Baked ripe plantain has much the taste of baked apple, but with a distinctive flavor, and a much more tenacious nature. Lastly, gathered green, dried and ground or pounded, an excellent meal or flour is produced, which makes delicious custards, puddings, gruel, etc., and is highly palatable and nutritious.

Plantains being the staple food of the Creole population, Plantain cultivation is a firmly established industry. Three or four varieties are grown, one or two of which, however, only on a very small scale. Two color-varieties, presenting hardly any distinction in the character of the fruit, but with the stems and stalks of the leaves blackish in one and green in the other, are most generally grown, and form the bulk of the cultivation. They pass under the names of the Black and White, Common or Cow, and sometimes Maiden Plantain. The others are the Giant, or Horse, and the Barooma, both very large-fruited kinds, the latter of which is not much grown. Plantains give a heavier yield than Bananas from the same land. They delight in the stiff, newly empoldered clay lands of this colony, not objecting to the slightly saline element found where the sea or river has invaded the place periodically at spring-tides while it was lying fallow under the natural bush-growth. Such lands yield heavily, but the crop is liable to suffer, if the seasons for the first two years after planting prove very wet, from the Plantain-disease of the colony. On dry land it does not do much damage. Introduced to such land it soon disappears again. The disease which affects Cocoanut-trees, from which many are from time to time lost in ill-drained situations, appears to be identically the same. In both cases it takes the form of internal decay, the substance turning to a sodden, offensively scented, putrid mass. The plantains produced by diseased trees are black inside, but not soft like the interior of the stems and root-stocks of the plants. They are, of course, quite unfit for food. Its nature has not yet been determined, though it has been observed closely in the fields, and samples of the affected parts have been examined by distinguished mycologists to ascertain whether or not it be of fungoid origin. The aboriginal Indian inhabitants of the interior do not, as a rule, cultivate this fruit, though they grow here and there in their cassava fields pineapples and a few bananas.

The Forests of Lower California.

ALONG the boundary between Upper and Lower California no forests exist and the variety of trees is very limited. A few miles south of the boundary, on the broad table-lands of auriferous gravel, begins the beautiful Piñon forest, composed mainly of a Nut Pine (*Pinus Parryana*).

These trees only partially shade the ground, forming an open forest, perhaps thirty miles in width in places, and extending from near the boundary line southward along the backbone of the peninsula, with only an occasional break, to the south end of the Sierra San Pedro de Martin. This forest is continuous for nearly fifty miles, the plateau which it covers varying in altitude from 3,500 feet to near 7,000 feet.

The Piñon is a small but very graceful tree, usually under thirty feet in height, with sheaths of short leaves, which densely clothe the tree. In shape it is very symmetrical, especially such young trees as have not been exposed to adverse conditions.

Encircling the meadows at high elevations is found the Bull Pine, or Piños, which J. G. Lemmon calls Pinus Jeffreyi, var. peninsularis (*Third Report California State Board of Forestry*, 200). It seems to be most abundant on the mountains east of the San Rafael Valley, at an elevation of 4,000 to 6,000 feet, where it attains magnificent proportions. Lemmon describes this tree as varying from medium to large size, 150 to 200 feet tall. The mining camp of Alamo, locally best known as Hanson's ranch, now obtains its main lumber-supply from this region. On the east the descent to the plain of the Colorado desert is very abrupt, and along the precipices overlooking the desert another Piñon Pine (*Pinus monophylla*) maintains a precarious existence.

A greater diversity of forest-vegetation exists on the San Pedro de Martin mountain, the highest mountain in Baja California. Its elevation at the highest point is over 11,000 feet. On this mountain occur the Sugar Pine, Coulter Pine, the White Fir and other trees which here find their most southern station. The summit of the mountain is a world in itself, over fifty miles in length, and was selected as the site of one of the old missions, the ruins of which may yet be distinguished. It is very difficult of access, and as yet has never been visited by a botanist.

The two views published in this issue will be of especial interest as giving a glimpse into an unknown land, and are from photographs taken by Messrs. Roscoe Howard and Russell Gunnis, the first men to invade these sylvan glades with a camera. The Pine in the foreground is Jeffrey's Pine (see page 185). The magnificent proportions of this tree may be realized by a comparison with the man standing beneath it, while the trees around even surpassed it in altitude.

The broad grassy meadows intervening between these patches of woods are still pastured by deer, and game of other descriptions abound. The coyote and the mountain lion are not unknown. The noonday siesta of the rattlesnake is seldom disturbed, while the call of the quail alone breaks the silence of the woods.

To the southward of this mountain an unbroken desert extends for two hundred miles, while desert sands alone intervene between its eastern base and the Gulf of California. Thus San Pedro de Martin furnishes the most southern typical California forest, the forest farther south being composed mainly of cacti and desert vegetation. *C. R. Orcutt.*

San Diego, Cal.

Plant Notes.

Some Recent Portraits.

To American readers the most interesting figure in the March issue of the *Botanical Magazine* is that of Cereus giganteus (t. 7222), the great Tree Cactus of Arizona and Sonora, but not a native of southern California, as is here stated, whose flowering in England last year Sir Joseph Hooker very properly considers one of the triumphs of horticulture. The plant which flowered at Kew is fourteen feet high and four and a half feet in girth, and was procured from Messrs. A. Blanc & Co., of Philadelphia, whose collection of succulent plants is probably unrivaled in the United States. C. giganteus is one of the vegetable marvels of the world, sending up a tall single shaft sometimes sixty feet in height, and sometimes separating near the top into two or more upright branches. It is the tallest, although not the stoutest, of all Cacti, and produces an edible fruit which the Indians of the south-west devour both raw and made into a conserve. Numerous attempts to cultivate this plant have been made since General Emory first gathered the seeds as long ago as 1847, during his military reconnaissance from the Missouri River to San Diego, in California; and although Dr. Engelmann succeeded in germinating the seeds and inducing the young plants to live, they have grown so slowly as to give little promise of ever reaching sufficient size to flower. A peculiarity of the plant not noticed in this description is the wonderful durability of the hard woody skeletons of the stems; these can be found lying about the desert and are used for the rafters of houses and apparently are indestructible by any influence of weather.

In the same issue are figures of Dianthus callizonus (t. 7223), a lovely Pink of the calcareous Alps of Transylvania, where it flourishes at an elevation of some seven thousand feet above the sea. It appears to be closely related to D. alpinus, and, like that species, has solitary flowers with crenate rose-colored petals with a deep red zone of color at their base speckled with white, although the flowers are larger and the leaves more glaucous than those of that species; Gongora gratulabunda (t. 7224), a not very showy or horticulturally interesting Orchid, probably a native of Granada, where it was discovered by Warscewicz, and was first flowered in 1857 by the late Consul Schiller, of Hamburg; Chrysanthemum rotundifolium (t. 7255), a handsome Hungarian species, differing from those in general cultivation by its strict rigid habit, acutely angled stem and branches, corymbose many-flowered inflorescence, and broad leaves. It belongs to the section Pyrethrum of the genus which includes most of the perennial white-flowered species, although it differs from them in the terete, not ribbed or angled achenes, and in the cupular pappus. It is a low-growing plant in cultivation, rarely exceeding the height of two feet, and in the rockery at Kew flowers freely throughout the summer; Lysimachia paridiformis (t. 7256), a native of China, where it was collected by Dr. Henry on the Yang-tse-kiang River in 1889. This is a handsome red-stemmed species with bold leaves, yellow corollas, marked like the calyx with glandular streaks, unequal filaments, monadelphous below, and few-seeded five-valved capsules. It is said to be more closely related to L. quadrifolia of the eastern United States than any other described species, although the flowers are much larger than those of the American plant.

New or Little-known Plants.

A New Strain of Roses.

IT now appears that the Rose may be added to the list of plants which may be treated as annuals. Seeds of a variety, under the name Rosa polyantha remontant, received from a French seedsman early in the year, were sown January 10th. They germinated rapidly in greenhouse warmth, and, after being pricked out, have been grown in a pan on a shelf in the cool house. They are now small plants, two to three inches high, and every shoot apparently is carrying a bud. The first flowers opened April 9th, just three months from sowing. The flowers are coming in considerable variety, white and pink mostly, single and semi-double, an inch or more in diameter. At present they are charming little plants, with small stems and small light green foliage. With their prolific flowering habit and rapid growth they can scarcely fail to prove useful and attractive garden-plants.

Their precocity is certainly novel and interesting. Some few years since Carnation-growers were much surprised by the introduction of a strain of these flowers which could be had in flower in four or five months from seed, surprise which has given way to satisfaction with the desirable Marguerites.

Perhaps, the Rose having developed a precocious habit, we may be favored with even finer forms than R. polyantha remontant. It would seem that flowers are being inoculated with some of the rapidity of the age.

Elizabeth, N. J. *J. N. Gerard.*

Foreign Correspondence.

London Letter.

Hippeastrums at Chelsea.—The special attraction this month in the nurseries of Messrs. J. Veitch & Sons is the collection of Hippeastrums, more popularly known as Amaryllises. These plants have been a specialty, almost a monopoly, of the Veitchian firm for the last ten years. They have raised many new varieties, every year producing a crowd of new seedlings, a large proportion of which are so far an advance as to merit certificates from the Royal

Horticultural Society. Several houses and frames are devoted exclusively to these plants at Chelsea, one house, sixty feet long by eighteen feet wide, being entirely filled with the flowering bulbs. These flowers are now rapidly approaching perfection, hundreds of fat succulent scapes bearing clusters of enormous trumpets of the brightest as well as the most delicate hues, and forming a picture which gives a horticulturist peculiar pleasure—a picture

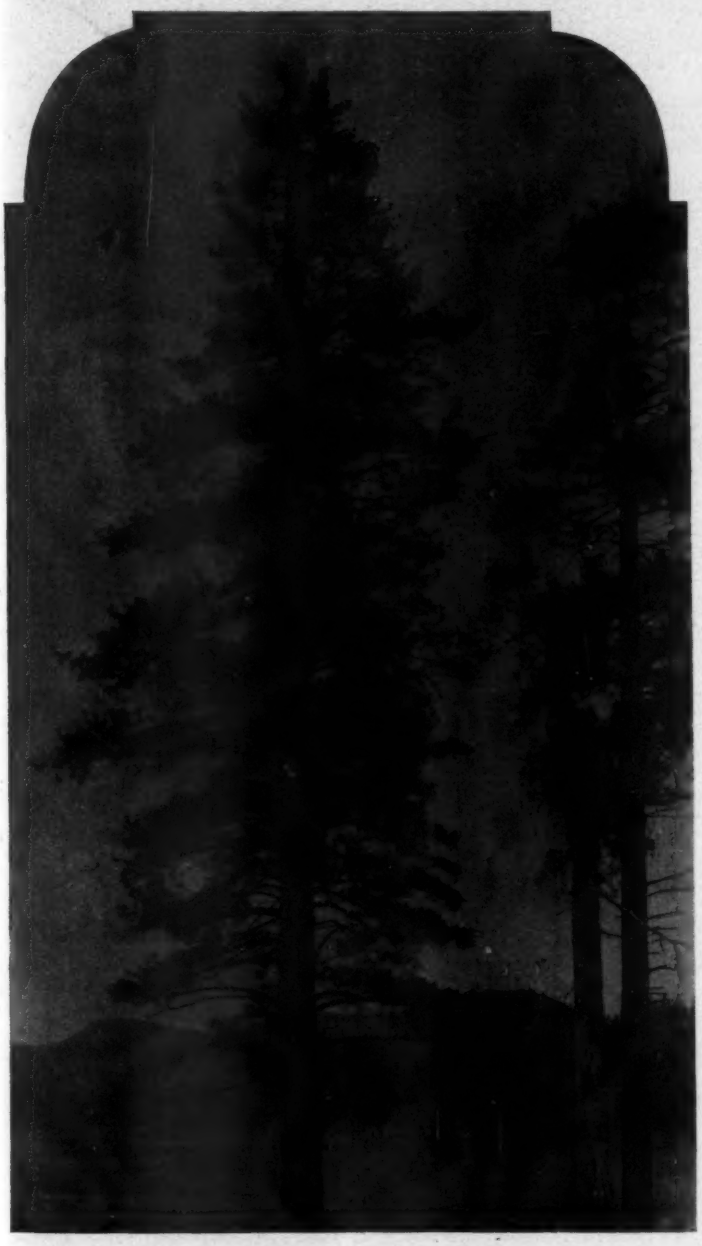

Fig. 28.—Pinus Jeffreyi, var. peninsularis.—See page 183.

of health, vigor and wealth of bloom; or, in other words, first-rate cultivation. Hippeastrums are among the most recent of the triumphs of horticultural skill. From several species with large flowers, but coarse and "unfinished" from the florist's standpoint, a race of plants has been evolved which have all the charm that size, rich and delicate colors and excellence of form give to flowers. The worship of the big for its own sake may be vulgar, but it is, at any rate, general. We all get excited over big flowers, from Rafflesia, Aristolochia and Victoria to the big Chrysanthemums and Begonias. Hippeastrums are big by nature, so that the breeder had only to improve them in form and tone down their sometimes harsh colors to ensure success. This has been accomplished, chiefly by Messrs. J. Veitch & Sons and the De Graafs of Leyden, and Amaryllis is to-day, in England at any rate, one of the most admired of garden-plants.

Cytisus scoparius, var. Andreanus.—I omitted this plant from those mentioned last week as good for forcing. At Kew there are now in flower some beautiful examples of it. They are standards, having been grafted upon the ordinary Laburnum, and each plant has a head a foot through, formed of many long branches, which are clothed for their whole length with beautiful yellow and rich madder-brown flowers. Among the many flowers at Kew at the present time these plants of André's Broom are, I believe, the most admired by visitors. They are grown in pot all the year, plunged in the soil outside during summer, then placed in a cold frame for the winter, and forced into flower in March by the application of a little heat. If your florists have not made the acquaintance of this Broom already, permit me to strongly recommend it as one likely to find universal admiration.

Amorphophallus Rivieri.—This is a small edition of A. Titanum, the huge Sumatran Arum flowered at Kew several years ago. The former is represented by two flowering specimens in an intermediate house at Kew, where it grows well, although it is hardy in a sheltered border. It does not often bloom in gardens, being grown rather for its handsome foliage. The inflorescence is a yard high and has a stalk a foot or so long, a trumpet-shaped spathe nine inches across, and a very long erect club-like spadix. Its color is reddish chocolate. Like all Arums, it emits a very penetrating and unpleasant odor for the first day or so after flowering. It is supposed to be a native of China, though nothing definite is known on this point, it having first appeared in the garden of Monsieur Rivier, in Algeria, about twenty years ago.

Beaumontia grandiflora.—This plant is now in flower in one of the stoves at Kew. It is a splendid stove-climber, and I gave an account of it in Garden and Forest two years ago, when it flowered magnificently in several gardens near London. It has no equal among large white-flowered stove-climbers; its long trumpets of ivory-white flowers, as large as those of Lilium longiflorum, being borne in great clusters on the end of almost every one of its numerous short lateral branches. It grows to a large size, and therefore requires plenty of room, both for the roots and stems. In a sunny tropical house, where it can be treated liberally in summer and kept dry at the root in winter, it makes a magnificent display in March or April. It is Indian and Apocynaceous.

Chinese Rhododendrons.—Chinese plants are conspicuous in the conservatory at this time of year. The Moutan Pæonies (forced), the Camellias, and various Rhododendrons, commonly known as Azaleas, are the glory of the greenhouse in spring. Of course, the two best known of the Chinese Rhododendrons are the hardy deciduous R. Sinensis (Azalea mollis) and the "Indian Azaleas," which are not Indian. Beside these, however, we now know of over sixty species, all natives of China, mostly in the province of Yun-nan. Some of these are in cultivation,

mostly through the missionary collector Delavay, who sent seeds of them to the Jardin des Plantes in Paris. I have seen the dried specimens of these Yun-nan Rhododendrons, and they look full of promise for the garden. Mr. Hemsley says that. taken as a whole, they are by no means so gorgeously beautiful as the Himalayan species, though many of them are highly ornamental.

A strikingly beautiful Rhododendron from China is R. Fortunei, which was introduced by Robert Fortune in 1859. It is perfectly hardy in England, forms a large handsome evergreen shrub, and produces in early summer large trusses of rosy white flowers nearly as large as those of the great R. Aucklandii, which it most nearly resembles. It is remarkable, too, in having seven corolla segments instead of the usual five of the flowers of this genus. R. rhombicum is Japanese. It is an interesting plant, deciduous, with rosy purple flowers, and easy to force. It was introduced to St. Petersburg in 1872. We grow it for the greenhouse at Kew. R. linearefolium, also Japanese, is an older garden-plant, but as yet very little grown in England, notwithstanding its hardiness here. It makes a fine bush, and is characterized by linear hairy leaves and flowers with long rose-purple segments divided to the base of the corolla.

Azalea Indica is now in every greenhouse, and is represented by very numerous magnificent varieties, mostly raised by the Belgian and French horticulturists. It is curious to read in the *Botanical Magazine*, under a figure of this species published eighty years ago, that it was then a "very rare plant, which has been long anxiously sought for by cultivators of curious and scarce exotics. We believe there are not above three or four individuals of it in the country, and of these only that from which our drawing was made has as yet produced any flowers." It is also stated that Kæmpfer enumerated twenty-one varieties cultivated in Japan, including white, red, yellow, purple and scarlet, with spots of the most contrary hues. Fortune found every mountain and hill in the central and southern provinces of China covered with Azaleas as abundantly as Heaths occur here. The finest varieties were cultivated in the gardens there; in fact, only the cultivated kinds were worthy of introduction. The Dutch cultivated the Indian Azalea in 1680, but lost it soon after its introduction. The first varieties obtained from China were brought by a sailor and sold to Knight, of King's Road, Chelsea, in 1833. There were five of them, one a double-flowered variety. Azalea mollis has been improved by the Belgians, chiefly by Monsieur Louis Van Houtte, who raised numerous varieties with flowers of better substance and more varied colors than any imported. It was in cultivation here in 1824, and then called R. Sinensis. Fortune reintroduced it in 1845, when it was rechristened Azalea mollis.

London. *W. Watson.*

Cultural Department.

The Best Garden Strawberries.

SHOWINESS rather than flavor has long been the end to which the originators of new varieties of strawberries have generally aimed. As is natural, they have had in view the needs of the market gardener, who is a large purchaser of plants, rather than the requirements of those who plant for home use. Therefore, an early, large, firm, showy, prolific berry has been the ideal one, with little regard to its table qualities. The chance that the best-flavored berry will possess one of these qualities in a marked degree is small. That it should possess enough of them to attract the large grower is improbable. So it is pretty much a matter of luck that we have really a first-rate berry at all.

The best berry that I have tested is the old Crystal City. In exquisiteness of flavor it is unrivaled and matches the best type of wild berry. Then its brilliant, glossy, crimson color makes it an ornament to any table. It is also an extremely early fruit, and for the first few days a very large one. But, while the excellence of color and flavor is retained, the berries soon run small and ill-shaped. Nor is it on the whole prolific; still with those who value quality first, it is well worth raising.

The mammoth size of the Sharpless has won for it a higher place than it deserves, for it is the most deficient in the highest qualities of the strawberry. The color is almost always dull and unattractive, while the flavor is insipid. Nor is it so productive on most soils as other kinds that surpass it in everything except size. The Cloud has nearly all the qualities of a good table berry, except beauty. It is too dull and coarse-looking. The ideal strawberry must adorn a table as a bouquet adorns it. If the strawberry were deprived of its beauty it would hardly rank as it does as the first of fruits. The Cloud is medium early, ripening about with Crescent. The Henderson, which ripens somewhat earlier, is an equally good fruit and more attractive in appearance. All of the very early berries that I have tried, except Crystal City, are deficient in real merit. The Crescent, if allowed to get thoroughly ripe, is surpassed by few among the medium early varieties. Then, too, its wonderful productiveness will help to atone for its shortcomings in the way of flavor. No other variety approaches it in yield. Thrushes and cat-birds, connoisseurs in fruit, prefer the Haverland.

It is only when we come to the later varieties that we find in the Bubach an approach to the ideal berry. Neither in color, size, quality nor productiveness does it leave anything to be desired. On rich soil it will ripen within a week of any other good variety, and in view of its great merit no one will begrudge it these few days of grace. In beauty, both of foliage and of berry, it is unapproachable. A bed of this variety, with leaves of richest green, among which the berries fairly glow, is as beautiful as any bed of flowers. Though somewhat late, the bearing period of the Bubach is correspondingly prolonged, so that berries can be gathered for fully as long a period as from any other variety. Another quality of the Bubach, which should recommend it to the amateur, is that it puts out but few runners even on rich soil. Runners, when neglected and allowed to cover a bed, have been the undoing of many a sanguine gardener. Judging by the appearance of the bed while leafless in the early spring, he hesitates to attack it with trowel or hoe, and he discovers when too late that it has become a jungle of foliage with a scanty show of fruit. As early as possible in spring—the autumn before would be better still—the bed should be thinned out remorselessly till no two plants stand less than six inches apart. The Bubach on good soil makes runners enough, but will give less trouble in this respect than almost any other kind. As it is a pistillate variety it should be planted with some staminate kind like Sharpless or any other blooming about the same time. The Cloud and Crescent are also pistillate, as indeed are most of the best Strawberries. Crystal City being staminate will grow alone. Staminate plants, however, are by no means indispensable, especially on rich soil; but as they increase the yield and quality of the crop, they should be planted with the pistillate varieties when possible.

What was said about the Crescent may be repeated about strawberries in general—let them get ripe. Rarely, indeed, are they allowed to attain this perfect state. We are so eager after the long winter-waiting, and they look so inviting, that at the first gleam of color off the berry comes. But the strawberry is not really at its best till some days after turning perfectly red; nor is it really wholesome till then. Leave a corner of the bed until the fruit thoroughly ripens, and you will thoroughly enjoy strawberries for the first time.

Kittrell, N. C. *O. W. Blacknall.*

Phajus grandifolius in a Window-garden.

WHEN, on the 20th of last February, Mr. John Saul, of Washington, sent me a piece of Phajus grandifolius from his Orchid-house, I called to mind the princely gift of an elephant which so embarrassed its poor recipient. To introduce this royal plant into my modest window-garden after it had been accustomed to careful nursing in the atmosphere of a hot-house, seemed very much like turning the elephant out to graze with a flock of sheep on a Scottish down. Nevertheless I determined to give it a chance. Fortunately, it was already well advanced, having four large healthy leaves and a short flower-stalk crowned with a bud, mysterious enough to us who have had little close acquaintance with Orchids, excepting a few hardy, small-flowered kinds. We could not guess what manner of surprise that close-shut bud might contain, but had little hope that it would ever condescend to reveal its secret in our sitting-room.

We did the best we could for our guest, potting it at once in fibrous loam, rich compost and the sphagnum which was

wrapped carefully around it when it came. The thermometer registered five degrees, Fahrenheit, that morning, but the box of tender plants arrived in perfect condition, many of them blooming, with earth around their roots and a coat of sphagnum and another of paper over that to keep them warm and snug, a fact which shows the ease with which tender plants can be sent long distances in cold weather if they are properly packed.

When we had potted the Phajus we searched the indexes of GARDEN AND FOREST and learned, among other things, that a refractory Phajus of another species had been induced to bloom by putting it in the very warmest spot in the hot-house and watering it freely. We took the hint, and watered our treasure twice a day with warm water, placing it as near to the base-burner, which heats our sitting-room, as possible. On cold nights we put the pot on the mantel-shelf, and we sprinkled it overhead with tepid water every day.

Under this treatment we soon found that the stem was stretching out. Up and up it climbed until it caught up to, and then towered above a fine Amaryllis in the same window which has a southern exposure. When it was three feet in height it stopped ascending, and the bud began to swell, but

Flower Notes.

STANDARD ROSES.—These are rarely, if ever, grown outdoors in this country, owing to the fact that the strong summer sun burns the bark of the R. canina stock, the only one used for standards. These are, nevertheless, very useful when grown in pots for piazza decoration in early summer. As we need to have ours in bloom by the middle of May, they are taken indoors toward the end of March, pruned and top-dressed with rotted cow-manure. If they have good healthy heads more shoots will be made than will carry good flowers, and so a little disbudding is advantageous. After blooming they are pruned back a little, some soil is taken out of the pots, and replaced by good fresh loam, cotton cloth is wound round the stems to protect the bark from the hot sun, and the pots are plunged out-of-doors for the plants to make their season's growth, when, after ripening with frost, they are placed in the cellar for the winter. Whether Rosa multiflora, the new stock (from Japan) which Mr. Jackson Dawson is experimenting with, will ever develop stems suitable for standards, is a question of time. For dwarfs I think it is destined to supersede the Manetti and Dog Rose stocks, owing to its hardiness and superior vigor.

Fig. 29.—A Pine Forest in Lower California.—See page 183.

so slowly that we could not be quite sure that it was really not standing still. In another week the bud separated into seven, and we watched it with increasing interest. At last the lowest bud changed its position from perpendicular to horizontal, and on the 4th of April it had become an exquisite flower, and greeted us with that wide-eyed look which makes one feel as if flowers could see.

Now, on the 12th of April, there are five of its curious blossoms to look at and to wonder over, with two others soon to expand. The plant is remarkably graceful, with its wing-like fresh green leaves, and the quaintly beautiful blossoms mingling sad shades of light chocolate, reddish purple and cream, so blended as to form an exquisite combination. The striped lip is a striking feature, and the silvery lining of the sepals and petals has a rich tender bloom.

Having succeeded so well with Phajus grandifolius, we are impatient for fresh worlds to conquer, and would be glad to know whether other amateurs have attempted to raise Orchids in window-gardens, and what varieties are best adapted for this purpose.

Rose Brake, West Va. *Danske Dandridge.*

Imported Roses are very unsatisfactory, because, for perfect satisfaction, there must be thorough acclimatization of both stock and cion. Mr. Dawson's stocks were American-raised seedlings of one year old, and, although they had only been grafted six weeks at the time of my visit, they had made remarkably rapid and substantial growth, and many were already in bloom.

MICHAUXIA CAMPANULOIDES.—I was pleased to see plants of this rare campanulaceous species looking fresh and sound after the winter. By some oversight this had not been protected by the usual covering of Pine-needles. The discovery of its hardiness was particularly interesting to me, as it is one of the things which are considered tender and very difficult to winter in England. A dry, warm, sunny position is generally recommended for it, but where it grew was neither dry nor warm, but the reverse. It is a biennial, and makes a large rosette of Dandelion-like leaves the first season from seed, and forms a Turnip-like root. The following season very rapid growth is made, and if vigorous it will produce an immense spike of white flowers, slightly tinged with pink, which rivals in stateliness the well-known Yucca angustifolia. Seeds should

be sown in early spring in the greenhouse. The seeds are so small, and the seedlings so delicate for a long time after germination, that it is almost useless to sow them in the open border. Years ago I grew some fine specimens of this plant in pots, but, although I was thus able to keep the roots dry and cool, I yet failed to save over thirty per cent. of them through the winter. If I have the good fortune to try them again in pots, I shall let them freeze.

Lenten Roses.—These plants, mostly hybrids of Helleborus Colchicus, H. guttatus, H. Olympicus, H. purpurescens, H. orientalis and others, of which the varieties Irene Heinemann, Hofgarten Inspector Hartweg and Willy Schmidt are representatives, are now in bloom. They are very hardy and desirable plants, and some are really beautifnl, many of the hybrids being far superior to the types in distinct and bright coloring. In this country they take the place of the Christmas Rose, which, however beautiful, is unsatisfactory, since its natural blooming season is at a time when our winters are too severe to allow of anything in the shape of active vegetation to flourish; and, on the other hand, the summers are too hot. The raising of hybrid Lenten Roses is slow, but very interesting work. The seeds are very slow to germinate. A year ago last August I sowed a lot in a box, and expected to see them come up last spring. Out of five hundred seeds sown only twelve germinated; but this year, I think, nearly all the others must have started, as the box is quite full.

The best plants I have seen were grown under Quince-bushes, which seemed to give them just shade enough.

Wellesley, Mass. *T. D. H.*

Narcissus Bulbocodium.

IT is a matter of surprise that this Narcissus, the Hooped Petticoat Daffodil, is not more generally known and cultivated by those who grow bulbous winter-flowering plants; while many others are grown in immense quantity, these little gems are seldom seen. When trying to obtain some bulbs last fall I was told they could not be found to the number required in any of three large cities, and they had to be imported before an order for 500 could be filled. No bulb gives more flowers in proportion to its size, as it is quite common to see five flowers to a bulb, so that when planted thickly in shallow pans the effect is very pleasing. It is possible that many have failed with this Narcissus because of attempts to force it. Under this treatment nothing but leaves will be produced, as is the case with the Snowdrop or Crocus. After being potted they should be wintered in a cold frame until the end of February, when the flowers will be produced with very little heat in a greenhouse or in a sitting-room window. N. Bulbocodium is of a bright yellow in the typical plant, but there is a variety known as Citrinus that has flowers of a lovely lemon-yellow, but this form cannot yet be obtained in quantity at reasonable prices. This last remark applies also to N. cyclamineus, the Cyclamen-flowered Narcissus, which to me is the prettiest of the whole genus. Its dainty and quaint appearance, so different from all others, makes one wish it would live longer in cultivation, but complaints are common that after once flowering it dwindles away, and such has been my experience. Mr. Barr, the Narcissus specialist, tells us it needs a moist situation when planted out; but, then, a New England winter is vastly different from that of Portugal, and planting outdoors here is not to be thought of. This kind was lost to cultivation for over one hundred years, owing possibly to the difficulty in growing it, and now that it is rediscovered there is a danger of its being exterminated by collectors unless better success is obtained with it under cultivation.

South Lancaster, Mass. *O. O.*

Permanent Narcissus Beds.

AFTER Narcissi, and the same may be said of other bulbous plants of this class, have done flowering they should not be disturbed until the leaves ripen. A good way to treat beds in which Narcissi have been planted, say from a foot to eighteen inches apart, is to sow the seed of Mignonette between the rows, which will about cover the ground by the time the foliage of the Narcissi has died, or, at least, has so far ripened that it will sustain no injury from the Mignonette. After the first frosts in fall the Mignonette may be removed from the bed and a good top-dressing of well-decomposed manure given. The fall rains will wash the plant-food down to the roots of the bulbs, which are in need of just such encouragement to enable them to start again and flower the next year better than before. Many other tender annuals might with advantage be used in this same manner, and a permanent bed of Narcissi can be had which will yield from year to year an abundance of flowers bright and fresh without any forcing-house feebleness. Then, too, the bulbs need not be thrown away after flowering, but they can be left in the ground to increase and produce double the quantity of bloom the next season. After the third year they should be lifted, separated and replanted. When the soil is a heavy tenacious clay the bulbs will be better if lifted every second year. The reason for this is that as the bulbs expand their growth is more or less hindered by the resistance made by the soil against which they press. If we lift a clump of any strong-growing Narcissus the third year from planting in a heavy soil, it will be found a compact mass of bulbs, small and imperfectly developed for want of space. These would hardly be able to flower another season; perhaps they would not flower well the third year even. Where the soil is light the bulbs meet less resistance, and they will be larger and stronger.

One who buys imported bulbs of Narcissi, such as Sir Watkin or Bicolor Horsfieldi, is at once struck with the difference between these and home-grown bulbs of the same varieties. The foreign bulbs have much shorter necks because of shallow planting, while home-grown bulbs have long necks, and present a very different appearance. Home-grown bulbs planted in August will prove far superior to imported ones in quality and abundance of bloom. There is a wide difference of opinion in Europe as to the best depth and time to plant. Our climate certainly calls for deep planting to guard against the action of frost, which may force the bulbs out of the soil and otherwise injure them. The lifting may safely be done as soon as the foliage begins to turn yellow. Roots will be found adhering to the bulb, but their work is done, and they are useless. It is good practice to reset the bulbs as soon as possible.

South Lancaster, Mass. *O.*

Growing Plants in Moss.—Sphagnum has some advantages over soil, as a medium for the roots of plants, especially where it is desirable to have them in boxes or stands, and more particularly under the shade of trees, which, like the Silver Maple, are always ready to throw out their feeders and appropriate all the plant-food within reach. There are many plants which will thrive and make a good display all summer in such situations if they can be protected from the encroachments of the tree-roots, and this can readily be accomplished by growing them in boxes, which may be either placed on the ground or elevated by means of rustic supports, as taste may dictate. One of the most satisfactory flowering plants for such a position is the Fuchsia, and many plants with ornamental foliage do well. These boxes need not be over three or four inches deep, and in filling them I generally put in about an inch of soil first, although this is not absolutely necessary. I then fill in the moss in layers, with a good sprinkling of hen-manure or other good fertilizer between the layers, and, if the box is shallow, carry the moss somewhat higher than the sides and round it up in the centre. The plants are then dumped out of pots and the balls of earth well covered in the moss. Some of the advantages in using sphagnum are its readiness to take up and retain water, it does not crust over, and its porous nature admits air so freely that there is very little danger of injury by overwatering. Sphagnum is now offered by several firms in various parts of the country at low prices by the barrel, and those who cannot have ready access to swamps that produce it can easily procure it.

Hammonton, N. Y. *Wm. F. Bassett.*

Papyrus Antiquorum, the Egyptian Paper-plant, as it is often called, has long been prized as an aquatic plant, and when associated in the water-garden with the so-called Lotus (Nelumbium speciosum) it can hardly be excelled in gracefulness. As a general decorative plant for the conservatory and dwelling-house it is rarely met with, but it is equally adapted to this purpose, and good plants can be produced in eight or ten inch pots. Large specimen plants require to be grown in water-tight tubs, and when used as the centre or as a background for groups and masses of plants it becomes a conspicuous object, towering ten to twelve feet high, with plumes two feet in diameter. As a pot-plant it is as readily grown as Cyperus alternifolius, and requires the same treatment, but being much stronger, it is not adapted to such small pots as the Cyperus. The soil should be good turfy loam, enriched with thoroughly rotted stable-manure. With the same soil in tubs without drainage it can be readily grown into large specimen clumps by using several pieces in one tub. When growing freely the tub should be occasionally filled up with liquid manure. General greenhouse temperature and treatment suits it admirably. As a summer decorative plant for the mixed border, or

in groups of sub-tropical plants, it succeeds well under the same treatment as Cannas, but for a specimen clump several pieces, according to size, should be set in half a kerosene-barrel, as recommended for conservatory specimens. The half barrel should be sunk until the rim is at the level of the ground and practically out of sight. With applications of liquid manure in hot and dry weather the clump will make an astonishing growth. The plants should not be allowed to suffer from high winds and storms, and a few neat stakes can be used, or other means of protection and support should be supplied. In the open ground this Papyrus is not inclined to grow so tall or make such rapid growth, but the stems will be stronger and will not need so much protection as the larger plants. Papyrus Antiquorum is propagated by divisions of the roots and by seed, but strong plants only produce seed to any extent. Seedlings raised early in the season make nice plants the first summer; strong clumps the second season.

Begonia Triomphe de Lemoine.—Plants of this variety were grown in the open border last summer with great benefit to the foliage and much better results in the way of flowers. For profuse and lasting flowers this variety probably heads the list of Begonias. The plants are fairly covered, as they have been for months, with masses of bright flowers, which scarcely even yet show signs of fading. The color is a bright light red, almost pink. A good stock of this plant in small sizes is very useful and attractive in the greenhouse in winter for decoration of the benches.

Corydalis bulbosa (or C. solida), the purple Fumitory, is a neat lttle bulbous plant now in flower. The leaves are attractive, and the effect is somewhat like that of a small Dicentra, the plant being only a few inches high, with numerous purplish red flowers, not especially attractive except as a patch of color in a dull season, when all color is welcome. The bulbs are hardy, and rapidly increase from offsets. There is also a white variety of this species, but this has not been grown by me.

Elizabeth, N. J. *J. N. G.*

Correspondence.

The Northern Limit of Sabal Palmetto.

To the Editor of Garden and Forest:

Sir,—Jutting out into the ocean at the mouth of the Cape Fear River, thirty miles below Wilmington, North Carolina, is the delta-like formation known as Smith's Island. Formerly the river had two mouths, one opening eastward at the north end of this island, and the other running out to the south. For the improvement of the entrance the mouth at the north end of Smith's Island has been closed by a stone dam nearly a mile long, connecting the island with the beach at Fort Fisher, of historic fame. This work has caused the current to scour out the southern channel until the river is now navigable by large ocean steamers, and its depth is still increasing. Having often heard of the sub-tropical character of the forest upon Smith's Island, I was glad to embrace the opportunity to visit it in company with Professor Holmes, State Geologist, and Mr. T. K. Bruner, Secretary of the State Board of Agriculture. Professor Holmes wished to study the geological character of the island, and Mr. Bruner and I had in view the lifting and preparation for removal to Chicago next spring of some specimens of the native plants, particularly the Palmetto.

Our course to the island was by Wilmington, and thence by steamer to Southport, the pretty pilot-town near the mouth of the river, from whence we reached the island in open boat. Southport occupies an elevated plateau on the right bank of the river, and its twelve hundred inhabitants are now stirred up with the idea of getting railroad communication to the Virginia coal-fields and making their beautiful village a great coaling-station. At present it is unspoiled. The streets are broad and clean, and all about, even in the middle of the streets, magnificent widespreading Live Oaks have been left, which add a peculiar charm to the place. In the cottage-yards native plants are not neglected, and I found beautiful specimens of the Ilex vomitoria, the North Carolina Tea, densely packed with its brilliant red berries, looking like glass beads from their translucent character. In one yard stood an Orange-tree, with leaves only slightly yellowed, testifying to the mildness of the locality. Phlox Drummondii, Verbenas, Sweet Alyssum, Violets and many other plants were blooming, as many of them had been all winter. Though an easterly gale was blowing, our boatman decided that we could cross to the island, four miles away, which we swiftly did, and landed in a quiet creek near the Bald Head Lighthouse. The island is about six miles long and four wide. Its only inhabitants are the lighthouse-keepers at one end and the life-saving crew at the other. The larger part, and, in fact, all the upland part, is covered by the densest forest-growth imaginable, so dense, indeed, that it can only be penetrated by cutting paths with an axe. It is literally a forest of evergreens. Hardly any deciduous trees are found, and few deciduous shrubs. The principal forest-growth is Ilex vomitoria, which forms impenetrable thickets, Holly, Live Oak, Water Oak, Red Cedar, Osmanthus Americana, Pinus Taeda, called here Rosemary Pine, and lastly, but not least, Sabal Palmetto. Sabal Adansoni is plentiful on the mainland far north and east of Wilmington, but we found none of this dwarf plant here.

The magnificent growth of Sabal Palmetto here in what seems to be nothing but pure sand and shell fragments surprised me. We found plenty of trees with tall columnar stems thirty feet tall to the crown of leaves, and an immense multitude of young ones. I cut and brought home with me single leaves which measure five feet from base to apex, seven feet broad, with petioles six feet long. This shows that, although the tree does not range farther north, for none are found in the forest on the mainland north of the Cape Fear River, it nevertheless reaches its full development on the island. The forest is inhabited by countless numbers of raccoons, a great many wild hogs and feathered game, both land and water fowl, while the waters abound in fish, oysters and clams. We selected some grand Palmetto-stems for our forestry exhibit at Chicago, and made arrangements to have a large number of moderate size carefully lifted and planted in large boxes, which will be plunged at once where they grow, in hopes of getting a fair number established so that they can be transported to Chicago next spring to plant around the North Carolina building. Specimens of the Ilex vomitoria and Osmanthus will be treated in the same way. In the high mountains of the west we are also lifting the Balsam Fir and other plants of that locality, so that we can illustrate the wide range of climate in the state with plants of the climate of Canada and of the Mexican Gulf side by side.

The size of the Live Oaks on this island is surprising when the character of the soil is considered. We bored seven feet in the soil near Live Oaks four feet in diameter, and found only sand and shell fragments. Over the tops of the tallest trees the Smilax, probably S. laurifolia, made a cover as dense as Ivy, and in all the hollows back of the sand-dunes Mitchella repens made a thick soft carpet. On the beach Sea Kale (Cakile) was in bloom, and furnished an acceptable dish to the lonely dwellers at the lighthouse.

Raleigh, N. C. *W. F. Massey.*

A Plea for Warm Tints in House-painting.

To the Editor of Garden and Forest:

Sir,—I have read with much interest the article on "Color in Rural Buildings," in your issue of March 30th, and while deferring to your contributor's well-known judgment in matters of taste, I would like to say a word on the side of those deeper and warmer colors in houses which she finds less well adapted to our atmospheric conditions than the whites, pale yellows and grays, to which she gives the preference, and at the same time to ask for some suggestion about the proper colors for villages.

Mr. Downing's rule for painting was to turn over a clod and paint the buildings the color of the soil disclosed, which he esteemed a method likely to bring the house into harmony with the surrounding earth. The color of the soil when wet would yield one tint, when dry another.

This rule, of course, if applied to a village, would produce monotony; but it was intended more especially to refer to the treatment of isolated country houses, which might be expected to rise from foundations widely different in hue, according to the geological formation of the region in which they were built. This method accounts for the unobtrusive and rather dingy shades which were employed in his time, which had, at least, the merit of not particularly forcing mistakes of construction upon the attention, and kept the building subordinate to the landscape. But, to my mind, the chief difficulty in painting a northern country house is that it must be adapted to two seasons, and, consequently, must hold its proper place in two widely differing color schemes.

In New England, for instance, for nearly eight months out of the twelve, every country house stands in a landscape from which all green but that of conifers has disappeared. It matters little of what hue a building is, when it has the vivid contrast of foliage to help it out, the soft dappling of leaf shadows upon its surface cast by surrounding trees, the relief of turf

and climbing vines about its foundations, and the sunny beauty of a summer sky behind. It is thus that the occupant of cities pictures a country house, it is thus that he sees it, and to this surrounding all mere summer cottages and houses may wisely be adapted.

But your true dweller in the country is faced by a different problem, having, unless his home stands in a bower of evergreens, to see it most of the time bare against a dull and lowering sky, with tall gray trunks of trees and a network of dark branches in relief against its surface, and frequently a snowy foundation and roof, to try its complexion still further. When the short and chilly days come, white and cold-colored houses have a shivery air, like lasses clad in summer gowns in a snowstorm. The green blinds make black spots against the prevailing whiteness, and the whole effect is apt to be disconsolate. Under these conditions a little red farm-house or school-house gives one a sense of satisfaction, of warmth and comfort, which shows that, after all, a dash of vigorous color does not come amiss in a New England prospect, which is sombre, if not dreary, for nearly three-quarters of the year.

Probably it was not æsthetics that our forefathers considered in their choice of colors, but economy, yellow ochre being the most enduring of colors, and white being the only pigment that permits refreshment of a building in the stained and disfigured portions, without making painting the whole a necessity. But it is one thing to have a white house in the south, surrounded by Oleanders and Camellias, with Palms and Eucalyptus to fleck it with shadows even on winter days, and another to see a house of this color staring bleak and cold under the shadeless gloom of a New England January.

The south of France and Italy show masses of foliage all winter long. The Live Oaks cast their dense shade, the glossy Camellias form clumps of verdure, Cypresses and Stone Pines are everywhere, the Eucalyptus is green in December; there are leafy hedges in the gardens always. In February the ground is dappled with Anemones and Violets. Winter there is but a nap of the blooming earth, not the syncope of the north, which sometimes almost makes one doubt whether the spring will ever come again, to loosen the cold slumberer from the iron bands in which the winter has bound her. Therefore, though our sun shines, and our skies are of pale blue, the conditions are widely different, and those gayly painted and frescoed exteriors, so amusing and pleasing amid the smiling winter surroundings of the Riviera, would seem as strangely amiss against our solemn Firs, and funereal Junipers, as a Puritan in motley.

For the same reason it seems to me that while light tints are agreeable in isolated summer houses, a country town must needs have more variety and warmth of color for those houses which are to be occupied at all seasons, and that there are many places where something warm and solid composes with the surroundings better than a light tint. The superiority of stained shingles over painted clapboards comes from the fact that the color surface is broken as it is in nature, and there are no broad stretches of one unvarying tint, which is of necessity inartistic. Stone and brick, plaster and unpainted wood take on a variety of shades that break up monotony, and unconsciously give satisfaction to the eye, which wearies of sameness; but neither stone nor brick nor plaster makes desirable country houses for all-the-year-round occupation in New England, for they gather dampness, and require artificial heat to keep them dry, except in the very middle of our short summer. Hence we are forced to the consideration of some artistic variety in the treatment, not only of wooden dwellings surrounded by grounds, but also of villages of frame-houses, which are even harder to manage, since one's neighbor's idea of color may be in direct conflict with one's own, or, what is perhaps even more trying, one may promptly find his carefully selected hue reproduced on a dozen different buildings, to which it may be inappropriate.

It is possible that in future days villages may be painted artistically to order, by contract, in sections that agreeably harmonize with each other, while affording some variety of general effect. At present the variations on the original yellow theme of colonial houses have reached a maddening variety, scaling from orange to straw color, with such intermediate shades of banana, and chrome, and lemon-yellow as happen to appeal to the proprietor's more or less educated eye.

This phase, too, is passing, but its succeeding fashion will also pass, and thus forever the old order changes, giving place to new, and while we are grateful to the wise ones who shed light upon our darkness, we mistrust the infallibility of any rule or any fashion as applicable to all situations, and all seasons, and seek for more light upon this difficult subject, which shows the same complications as the effort to make a house serve with equal comfort as a winter and a summer dwelling.

Hingham, Mass. *M. C. Robbins.*

Sweet Peas

To the Editor of Garden and Forest:

Sir,—Is it too late to plant Sweet Peas?

Albany, N. Y. *R. A.*

[It is not too late in the latitude of Albany, but, as a rule, the earlier Sweet Peas can be put in the ground the more vigorous will be the plants. They should be planted just as soon as the ground can be worked in spring, and there need be no fear of injury from frost. The ground should be worked deep, say eighteen inches or even two feet, and fairly good garden-soil will give an abundant yield. It is well to plant thinly in a furrow some five or six inches deep, covering the peas with about three inches of soil and drawing the earth up to the plants as they grow until the bed is level. Give them tall brush or a wide trellis of wire-fencing to run upon and cut the flowers every day, and they will keep on blooming until frost.—Ed.]

Sand Dunes.

To the Editor of Garden and Forest:

Sir,—I should like to offer a plan for protecting water-fronts from shifting sand that suggested itself to me while examining a harbor on Lake Michigan.

In Garden and Forest (vol. iv., p. 503) Mr. J. B. Harrison speaks of the necessity of beginning near the water's edge. There may in places, however, be serious objections to planting the outer row of Cedar-saplings suggested by him. A quicker and cheaper plan would consist in driving sharpened boards, six or eight inches wide, and, according to circumstances, from three to six feet long, into the sand in a continuous row, thus making an obstruction that would catch the moving sand in drifts. As these boards become uncovered they could be driven deeper, and if buried could be raised by hand. In this way enough protection would be given that the spontaneous growths would be given an opportunity to gain strength, and it would be easy to make the shelter permanent by planting a close shelter belt behind this fence, if I may so call it. On the Lake Michigan shore the best deciduous tree would be the Balm of Gilead; it thrives well on exposed sandy shores, and could be cheaply propagated from ripe wood driven into the sand. The proper evergreens to plant with it are the White Cedar and the White Pine, the former for a permanent low screen, and the latter to eventually succeed the Balm of Gilead.

It can readily be seen that a screen of this character would cost very little. A couple of men could cut down Balm of Gilead or similar trees and cut them up into cuttings two or three feet long, and plant these very quickly. It would require about sixty-five feet of cull lumber per rod of fence. This lumber would cost, hereabout, not over forty cents. It would be interesting to know what it would cost to protect a mile of shore-front, and, if it has been tried anywhere, readers of Garden and Forest would like to hear the result.

Milwaukee, Wis. *Charles L. Mann.*

The subject of the fixation and reclamation of sand-dunes is one which has attracted the attention of engineers in the Old World for years, and a large literature and record of experience exist; but of valuable works on the subject I know but one, the classic treatise of Joseph Wessely, *Der Europæische Flugsand und seine Kultur* (The European Shifting Sands and their Cultivation), Vienna, 1873, which, while treating the subject with special reference to local conditions in the desert of Hungary, yet enlarges upon the principles which rule everywhere, and should be in the hands of any one attempting the solution of such problems.

The difference between the shifting sands of the interior and those of the seashore is, that in the first case a great mass of sand is in question, which once fixed is fixed forever; while in the latter case the sea is constantly bringing up new material, and hence the work of fixation is never entirely done, and requires more or less constant watching and renewal. Mechanical works, such as fences, covering with brush, straw, turf, will be less effective and less per-

manent than a fixation by means of a plant-cover, the root-system of which penetrating in all directions will bind the sand as no mechanical appliance can.

To establish a plant-cover, however, it may be necessary to quiet the sand first temporarily, and to some extent artificially, before the planting is begun. The necessity for this and the means and methods will differ according to local conditions.

When dealing with sand-dunes at the seashore it is necessary to first cut off to some extent the supply of sand constantly brought from the sea. This is done by raising the shore or front with a tolerably steep grade, which, while having slope enough not to be endangered by underwashing, forces the waves to carry back the sand they bring up. This is most simply done by establishing an artificial front or forward dune. This forward dune is formed by running two parallel fences along the shore, made of brushwood hedge fashion, six feet apart, and so high that the top of each may be, say, eight to ten feet above average water-level. These hedges are braced up if necessary by post and rail, and are expected during the summer to catch the shifting sand between, in front and rear, and thus to form the forward dune.

Should this dune not be high enough to keep off the sea winds and their effects upon the sand masses beyond, especially if these are extensive, a second dune, the so-called "high dune," established in a similar manner, only higher and parallel with and behind the first, becomes necessary. To make the dune effective against the sand which is constantly added to it Sand-grasses are planted, which, as the sand covers them, grow through it to the surface, and keep the dune permanently in proper condition. The best grass for the purpose has been found to be Ammophila arenaria, which is easily and successfully transplanted. This grass is native along the Atlantic coast and the lakes, as well as in Europe. It has been used, I understand, to bind the sand of the Golden Gate Park, San Francisco.

When the shifting sand has been quieted, reforestation can be resorted to to keep it permanently and securely in place. For this purpose the Pine tribe furnishes, probably, most desirable material, although other kinds will grow where a fresh subsoil is present, especially Poplars and Cottonwoods, and some Willows, which are most easily propagated by cuttings. The choice of material might be indicated by the surrounding flora. Brush Willows and any other low shrubs have been found objectionable because they induce the formation of hillocks around them.

Above all, the dune must be constantly watched, and any small damage repaired at once, since small defects are very rapidly enlarged, and prompt action can prevent this.

Forestry Division, Washington. *B. E. Fernow.*

Recent Publications.

The Study of Leaves. By Mary B. Dennis. D. Appleton & Co. This little handbook is not an exhaustive treatise in which everything that is known about leaves is set forth in due order, but it is intended simply to help and encourage the acquiring of habits of observation by the young—that is, it does not attempt to tell children what other people have discovered, but it directs their attention to the proper way of finding out things for themselves. Very little, therefore, is said in the book about the physiological functions of leaves or their chemical constitution, as the primary purpose in view is to direct children how to look at leaves so as to describe and identify them. To this end there are something like a hundred blank schedules for leaf-analysis. The child is instructed that it is not necessary to know the name of a plant before its leaf can be analyzed, but that the first thing to do is to become familiar with its appearance. The first title in the schedule is "Arrangement." In one of the few preliminary pages it has been explained what the terms opposite, alternate, radical, whorl and fascicled mean, and there are excellent outline sketches to illustrate the explanations. What the child has to do then is to examine the leaf and write in the schedule the proper descriptive term for its arrangement. The leaf is studied in the same way with reference to all the various items in the schedule, such as its venation, margin, surface and the rest, and when this has been done and the results recorded the student must have obtained a pretty distinct idea of the external appearance of the specimen. Besides this there are some short directions for pressing leaves, for drawing them, for painting them, and printing them and skeletonizing them. Altogether the little book can be thoroughly commended to parents and teachers, and the child who begins the study of leaves in accordance with these directions, and pursues it with ordinary diligence during the coming season, will have acquired not only some knowledge, but what is much better, the habit of getting knowledge which will be retained through life.

The Plant World; its Past, Present and Future: An Introduction to the Study of Botany. By George Massee. New York, Macmillan & Co.

The author of this little book is the lecturer on botany to the London Society for the Extension of University Teaching, and it is another of the numerous attempts to furnish instruction to everybody in all branches of science. It contains seven chapters, the first of which is entitled Plant Architecture, and attempts to give the various uses of the different organs of plants, the modifications of these organs caused by external agencies and their microscopic structure. Then follows a chapter on the chemistry and physics of plant-life, and another on the arrangements for protecting various plants against climate, living enemies and waste of energy in the struggle for existence. A treatise on the reproduction of plants follows this, and then comes a chapter on the relationships of plants, which includes a discussion of the leading problems in systematic botany. The last chapters are devoted to history and geography, in which the distribution of plants and their evolution from the vegetation of early geological periods is discussed. All this is comprised within two hundred brief pages, and while the facts are clearly stated the book can hardly be considered as an effective introduction to botanical study. The proper introduction to botany is the study of plants, and while the facts which are here collected are very useful as references to persons who have some acquaintance with the science, this is not the kind of a work to put in the hands of beginners either as an aid or an encouragement to botanical study. The information given is such as persons of ordinary education might wish to possess, and persons who have some rudimentary knowledge of botany will find much enjoyment and profit in the book. It is not sufficiently complete for the specialist, on the one hand, though it may suggest to him at different points some interesting line for research, nor is it a book for beginners, at least not a book for young beginners. It belongs to a class of books, however, which is multiplying very rapidly in these days, when the work of popularizing science is considered so praiseworthy. If this phrase means the explanation in popular language so far as this is possible of the more important truths and principles which men of science have discovered, the object is certainly commendable. So far, however, as their leading purpose is to enable the student to obtain a knowledge of some science without personal study and investigation, they must always prove disappointing.

Notes.

Professor Halsted has sent out his check-list of American weeds, amounting to 751 species and varieties, without including those in sub-tropical Florida. There is a special list of one hundred of the worst or most annoying species.

The manual issued by the B. A. Elliott Co., of Pittsburgh, and entitled *A Few Flowers Worthy of General Culture*, is considerably more than a price-catalogue. It is beautifully printed, and some of the illustrations are unusually soft and delicate.

For hanging baskets the drooping Maiden Hair Ferns are not used as freely as they might be. Of these Adiantum dolabriforme and A. ciliatum are especially adapted to basket culture by their habit. The second one will endure a much cooler temperature than the first, and is very distinct and elegant in appearance.

It is reported from Chicago that material for the horticultural display at the Columbian Exposition is beginning to arrive in large quantities from abroad. As an example it is stated that H. Cannell & Son, of Swanley, England, have sent one hundred varieties of herbaceous Pæonies and a large number of perennial Phloxes.

Mr. E. S. Nadal's interesting article on the "New Parks of New York," published in *Scribner's Magazine* for April, gains especial value from the accompanying map, as few persons even in New York realize how large are the areas set apart for public enjoyment, how diversely they lie, or what will be the extent of the proposed parkways connecting them.

In the last number of the *Gardeners' Magazine* Rev. G. H. Engleheart pronounces the White Trumpet Daffodil, Madame De Graaff, as perhaps the finest existing Daffodil. It is very large, of great substance, and is said to be a seedling from the Empress of India by the pollen of Albicans. It was introduced some three years since, but we believe the price is still a guinea a bulb.

During the past season twenty-four field meetings have been held by the Torrey Botanical Club, of this city, with an average attendance of twelve persons. One of the most interesting results of the year was the listing of all the plants on Sandy Hook, New Jersey, which was visited on July 25th. Asplenium platyneuron, a Fern which usually grows in rocky spots, was here found flourishing in pure sand, and among introduced plants Lactuca Scariola was noticed.

The Superintendent of Parks in Brooklyn says that Prospect Park "is visited by nearly thirteen million people annually, for its attractions alone, because it is little used as a thoroughfare between different portions of the city, as is the case with many other parks. During a storm the park is deserted by every one except the guards, but within half an hour after the skies clear the roads are covered by carriages, or, in winter, by sleighs, while snowflakes still linger in the air."

"No garden in Japan," says a recent writer, "is considered complete without its group of Maple-trees placed beside some artificial hill toward the west to receive additional splendor from the setting sun. Grassy slopes and valleys are planted with these trees, with the object of bringing into one limited prospect the red and golden tints in which the natural scenery of the wooded hills abounds. Picnicking and mushroom-gathering are pastimes which accompany the viewing of the Maple."

Arbor Day is now celebrated in Nova Scotia and New Brunswick, and in the *Educational Review*, published at St. John, an editorial on the observance of the day closes with some sensible suggestions like the following: Work should be the most important part of the programme; few trees should be planted, but they should be planted well and with careful preparation beforehand; school premises should be cleared up and beautified; the fatal mistake should be avoided of supposing that everything is done when Arbor Day is over.

In a bulletin just issued by the Experiment Station of the State Agricultural College at Michigan, Professor Taft, the horticulturist, reports on a test of different varieties of Strawberries last year that the most promising early sorts are Beder Wood, Lovett and Van Deman, while Haverland, Pearl, Parker Earl and Bubach No. 5 are the best which follow soon after. Of late sorts Belle, Florence and Gandy succeed the best. Of the newer Raspberries, Cromwell, a seedling from Connecticut, is in most respects similar to Souhegan, and thus far has proved more healthy and somewhat more productive. Of the late varieties, Royal Church, from Ohio, is one of the best.

Some tests made at the Kentucky Agricultural Experiment Station show that the Bordeaux mixture may be effective as an insecticide. Potatoes, which were infested and injured by the Flea-beetle (Crepidodera pubescens) were sprayed with the mixture, and the injury by insects was promptly checked. As new leaves unfolded between the sprayings the beetles would gather upon them, but were driven off as soon as the plants were sprayed again. The March blister-beetle, which appeared later in the field, avoided entirely the plants which had been sprayed, and although they occasionally gnawed the leaves of plants after the lime and copper had been washed off, it was plain the mixture could have saved the crop from most of the injury inflicted by these two beetles.

In an address read before the Wisconsin Horticultural Society, Professor Goff urges the young towns and villages of the west to set apart public pleasure-grounds before it is too late. He suggests that every village have its park, which shall be regarded from the beginning as an adjunct of the school, and be located sufficiently near the school-house to make it easy of access by the boys and girls. If the trees and shrubs are labeled with their common and botanical names the park will have a greater educational value, and if the planting is done with some ceremonies in which the young people can play a conspicuous part they will take more interest in it, and there will be less trouble experienced in securing from their parents the money needed to maintain it, and this trouble will become smaller and smaller as the years roll on.

The Journal of Horticulture prints a list of varieties of Chrysanthemums, arranged according to the number of times each one was used at the exhibitions of the Royal National Chrysanthemum Society last year, and the average for seven years past. In comparing the first twenty-four on the list last year with the first twenty-four on the list in 1885 it is seen that very few changes have taken place—that is, all the favorite exhibition flowers of seven years ago remain favorites still. An examination of the relative positions occupied by the leading varieties during the last seven years shows no indication of decline in any of them. Among the incurved varieties the Empress of India has regained the first place, and among Japanese varieties Etoile de Lyon still holds the place it secured last year at head of the list.

The power of trees to regulate their own temperature to a certain extent is seen in the fact that their twigs are not frozen through in winter, nor does their temperature increase in summer in proportion to the temperature of the surrounding atmosphere. Their vitality protects them from both extremes. The bark is a bad conductor of heat, and is to a certain extent the clothing in which the plant is wrapped. Then the surface evaporation of the leaves produces in summer a freshness in them, and we know how cool they feel even on hot days. Evaporation, however, does not explain the coolness of many kinds of fruit that are enclosed in a hard envelope, through which evaporation seems almost impossible. The juice of a fruit grown by the Ganges is said by Hooker to be of a temperature of seventy-two degrees, Fahrenheit, while the sand in which it grew was found to be from ninety to one hundred and four degrees.

In the last number of *Insect Life* it is reported that the potato-tuber moth, which has been very destructive for many years in New Zealand, Australia and Algeria, has reached this country. Specimens received at Washington from Kern County, California, have been identified by Professor Riley. It was at first supposed that the insect had been accidentally imported on some of the steamers from New Zealand or Australia among the stewards' supplies. Later information, however, is that they were obtained from a Chinese gardener, so that it is not improbable that the insects were imported directly from China. The larvæ of this moth bore into the potatoes while they are still under the ground and after they are stored, and as much as three-fourths of the crop has been destroyed during a single season in Algeria. Strenuous efforts should be made to stamp out this pest before it obtains a foothold, and the immediate destruction of all infested potatoes is recommended.

Professor Kedzie sums up the results of experiments with Sugar Beets in Michigan last year, from the farmer's standpoint, that the outlook for the beet-sugar industry promises well over a large part of the southern half of the state. Some of the considerations which should incline farmers toward this industry is that the crop promises large cash-money returns, a good home market, and a concentrated product which costs little for transportation. Beet-raising properly conducted does not exhaust the soil, for the materials removed in sugar are only carbon and water, there being no nitrogen or potassium or phosphorus carried off, as there is in wheat. Besides this, the proper cultivation of Beets is the best preparation for a grain crop. In order to keep the soil from exhaustion the waste parts must be directly or indirectly returned to the fields. The tops and crown, not used in manufacturing, and the beet-pulp from which the sugar has been extracted are excellent cattle feed. In this way stock-feeding is a necessary part of the routine in a sugar-beet farm, and so is the rotation of crops. Beet-raising therefore compels thorough cultivation and good farming, which is a strong point in its favor. From the manufacturer's standpoint, it should be considered that a Beet-sugar plant is very costly, and that every device to reduce labor, save cost and turn out the largest and best product must be used when entering into competition with an established industry in the Old World. Americans now have a bounty of two cents on a pound, but they must contend with the experience and accumulated machinery of a half-century of beet-sugar-making in Europe. No such manufactory can succeed without an experienced and competent director, without abundance of good water, cheap fuel and transportation facilities, and unless it is located in a district with a suitable soil and climate which can be trusted to furnish 3,000 acres of Sugar Beets a year of good quality. In view of these facts manufacturers are cautioned to go slow.